NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

FILTER STRIP

(Acre)

CODE 393

DEFINITION

A strip or area of herbaceous vegetation situated between cropland, grazing land or disturbed land (including forestland) and environmentally sensitive areas

PURPOSE

- To reduce sediment, particulate organics and sediment adsorbed contaminant loadings in runoff
- To reduce dissolved contaminant loadings in runoff
- To serve as Zone 3 of a Riparian Forest Buffer, Practice Standard 391
- To reduce sediment, particulate organics and sediment adsorbed contaminant loadings in surface irrigation tailwater
- To restore, create or enhance herbaceous habitat for wildlife and beneficial insects
- To maintain or enhance watershed functions and values

CONDITIONS WHERE PRACTICE APPLIES

This practice applies in areas situated below cropland, grazing land or disturbed land (including forestland) where sediment, particulate organic matter and/or dissolved contaminants may leave these areas and enter environmentally sensitive areas.

This practice may also be applied in areas where permanent vegetative establishment is needed to enhance wildlife and beneficial insects or to maintain or enhance watershed function.

CRITERIA

General Criteria Applicable to All Purposes

Filter strips shall be designated as vegetated areas to treat runoff and are not part of the adjacent cropland rotation.

Overland flow entering the filter strip shall be primarily sheet flow. Concentrated flow shall be dispersed.

State listed noxious weeds will not be established in the filter strip and will be controlled if present.

Filter strip establishment shall comply with local, state and Federal regulations.

If application of this practice will affect cultural resources (archaeological, historic, historic landscape or traditional cultural properties), follow NRCS national policy and Colorado operating procedures for considering cultural resources.

Additional Criteria to Reduce Sediment, Particulate Organics, and Sediment Adsorbed Contaminant Loadings in Runoff

The minimum flow length required for this purpose shall be 20 feet.

The filter strip size requirement shall be determined based on the RUSLE-R factor value for the site.

The filter strip shall be established to permanent herbaceous vegetation consisting of a single species or a mixture of grasses, legumes and forbs adapted to the soil, climate, nutrients, agricultural chemicals and practices used in the current management system.

Species selected shall have stiff stems and a high stem density near the ground surface. Stem density shall be such that the stem spacing does not exceed 1 inch.

Filter Strip Location and Size Requirements

a. The filter strip shall be located along the downslope edge of a field or disturbed area. It shall be placed on the approximate contour to the extent practical. Variation in placement on the contour should not exceed a 0.5 percent longitudinal (perpendicular to the flow length) gradient.

b. The drainage area above the filter strip shall have greater than 1 percent but less than 10 percent slopes.

c. The drainage area to filter strip area ratio shall be less than 70:1 where RUSLE-R factor values are 0-35 and less than 60:1 where RUSLE-R factor values are 35-175.

d. The average annual sheet and rill erosion rate above the filter strip shall be less than 10 tons per acre per year.

Additional Criteria to Reduce Dissolved Contaminants in Runoff

Additional Criteria to Reduce Sediment, Particulate Organics and Sediment Adsorbed Contaminant Loadings in Runoff shall also apply to this purpose.

The flow length required for this purpose shall be in addition to the flow length required to Reduce Sediment, Particulate Organics and Sediment Adsorbed Contaminant Loadings in Runoff.

The minimum flow length for this purpose shall be 30 feet.

Filter strip flow length required to reduce dissolved contaminants in runoff shall be based upon management objectives, contaminants of concern and the volume of runoff from the filter strip's drainage area compared with the filter strip's area and infiltration capacity.

Additional Criteria to Serve as Zone 3 of a Riparian Forest Buffer, Practice Standard 391

Except for the location requirements, the criteria given in "Reduce Sediment, Particulate Organics and Sediment Adsorbed Contaminant Loadings in Runoff" shall also apply to this purpose.

If concentrated flows entering Zone 3 are greater than the filter strip's ability to disperse them other means of dispersal such as spreading devices must be incorporated into the plan.

Additional Criteria to Reduce Sediment, Particulate Organics and Sediment Adsorbed Contaminant Loadings in Surface Irrigation Tailwater

Filter strip vegetation may be a small grain or other suitable annual with a plant spacing that does not exceed 4 inches.

Filter strips shall be established early enough prior to the irrigation season so that the vegetation can withstand sediment deposition from the first irrigation.

The flow length shall be based on management objectives.

Refer to the Colorado Cover Crop Specification Guide, Code 340, for species and seeding rate recommendations.

Additional Criteria to Restore, Create, or Enhance Herbaceous Habitat for Wildlife and Beneficial Insects

If this purpose is intended in combination with one or more of the previous purposes, the minimum criteria for the previous purpose(s) must also be met. Additional filter strip flow length devoted to this purpose must be added to the length required for the other purpose(s).

Any addition to the flow length for wildlife or beneficial insects shall be added to the downhill slope of the filter strip. Vegetation to enhance wildlife may be added to that portion of the filter strip devoted to other purposes to the extent they do not detract from its primary functions. Plant species selected for this purpose shall be permanent vegetation adapted to the targeted wildlife species or beneficial insect population(s).

If this is the only purpose, filter strip width and length shall be based on requirements of the targeted wildlife species or beneficial insect population. Density of the vegetative stand established for this purpose shall consider targeted wildlife habitat requirements and encourage plant diversity. Dispersed woody vegetation may be used to the extent it does not interfere with herbaceous vegetative growth or operation and maintenance of the filter strip.

The filter strip shall not be mowed during the nesting season of the target wildlife species.

Livestock and vehicular traffic in the filter strip shall be excluded during the nesting season of the target wildlife species.

Additional Criteria to Maintain or Enhance Watershed Functions and Values

Filter strips shall be strategically located to enhance connectivity of corridors and non-cultivated patches of vegetation within the watershed.

Filter strips should be strategically located to enhance aesthetics of the watershed.

Plant species selected for this purpose shall be for establishment of permanent vegetation.

CONSIDERATIONS

Filter strips should be strategically located to decrease runoff and increase infiltration and ground water recharge throughout the watershed.

Filter strips for the single purposes of wildlife/beneficial insect habitat or to enhance watershed function should be strategically located to intercept contaminants thereby enhancing the water quality of the watershed.

To avoid damage to the filter strip, use vegetation that is tolerant to herbicides used in the upslope crop rotation.

Consider using this practice to enhance the conservation of declining species of wildlife, including those that are threatened or endangered.

Consider using this practice to protect National Register listed or eligible (significant) archaeological and traditional cultural properties from potential damaging contaminants.

Filter strip size should be adjusted to a greater flow length to accommodate harvest and maintenance equipment.

PLANS AND SPECIFICATIONS

Plans and specifications shall be prepared for each field or treatment unit based on the Criteria, Considerations, and Operation and Maintenance sections of this standard. Specifications shall describe the requirements for applying this practice to meet the intended purpose.

Specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan or other acceptable documentation.

OPERATION AND MAINTENANCE

For the purposes of filtering contaminants, permanent filter strip vegetative plantings should be harvested as appropriate to encourage dense growth, maintain an upright growth habit, and remove nutrients and other contaminants that are contained in the plant tissue.

Control undesired weed species, especially state-listed noxious weeds.

Prescribed burning may be used to manage and maintain the filter strip when an approved burn plan has been developed.

Inspect the filter strip after storm events and repair any gullies that have formed, remove unevenly deposited sediment accumulation that will disrupt sheet flow, re-seed disturbed areas, and take other measures to prevent concentrated flow through the filter strip

Apply supplemental nutrients as needed to maintain the desired species composition and stand density of the filter strip.

To maintain or restore the filter strip's function, periodically regrade the filter strip area when sediment deposition at the filter strip-field interface jeopardizes its function, and then re-establish the filter strip vegetation, if needed. If wildlife habitat is a purpose, destruction of vegetation within the portion of the strip devoted to that purpose should be minimized by regrading only to the extent needed to remove sediment and fill concentrated flow areas.

Grazing shall not be permitted in the filter strip unless a controlled grazing system is being implemented. Grazing will be permitted under a controlled grazing system only when soil moisture conditions support livestock traffic without excessive compaction.

REFERENCES

Colorado Field Office Technical Guide, Section I. Plant Materials Technical Note No. 59. 2002. Plant Suitability and Seeding Rates for Conservation Plantings in Colorado. USDA, Natural Resources Conservation Service. Lakewood, CO.

Colorado Field Office Technical Guide, Section I. Erosion Prediction. Colorado RUSLE Isoerodent "R" & C/K Zone Map, Non-Irrigated Cropland. 1997. USDA, Natural Resources Conservation Service. Lakewood, CO.

Colorado Field Office Technical Guide, Section IV. Cover Crop Conservation Practice Standard Code 340. 2003. USDA, Natural Resources Conservation Service. Lakewood, CO.